

~~CONFIDENTIAL~~File: ED139. Balloon
General

3 April 1956

MEMORANDUM FOR: Chief/SR/COP/FI

SUBJECT : SR Balloon Requirements

REFERENCE : Memorandum dated 8 November 1955, Same Subject,
from SR/COP/FI to Chief, Technical Services Staff

1. The referenced memorandum stated that the operational horizons of balloon use had been greatly expanded and a new concept of operations could be considered. Three ISS projects were pointed out as contributing to this situation:

- (1) The launching shroud which has been completed
- (2) The hot air balloon which is under development, and
- (3) The directional balloon which is also under development.

Development requirements were outlined as follows: (a) a medium altitude oxygen system for extended flights, (b) a medium altitude gondola, (c) empirical and experimental data on medium altitude flights and hot air personnel balloons, (d) a hot air generator, (e) a powered balloon, (f) a remote altitude control unit, (g) a silent diffuser, and (h) a small light-weight hydrogen generator.

2. All of the requirements stated should be fulfilled by projects which are currently underway or are in the basic study phase and development will proceed as rapidly as feasible. It is understood that the empirical and experimental data referred to in paragraph 4-c and 4-e refers to data obtained from actual flight tests. SR representatives will be invited to attend some experimental flights if this is desired, progress reports on the status of development on these requirements will be made periodically and complete reports will be made available upon the completion of these projects.

3. In reference to the time schedules mentioned for two of the projects, it is considered appropriate at this time to state that the hot air balloon development program is currently scheduled for the remainder of 1956 and should result in a prototype item by 1 January 1957. The powered balloon project is believed to have tremendous potential for Agency operations if the new concept proves to be workable. This project is in such an early


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stage of development that a completion date estimate at this time would very likely prove to be completely unrealistic.

4. The interest expressed by SR in balloon development is considered most gratifying to TSS and every effort will be made to fulfill SR requirements as efficiently and expeditiously as possible.


Chief
TSS/Engineering Division

DD/P/TSS/ED 

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SECRET*File: ED-139 Ballon
General*

8 November 1955

MEMORANDUM FOR : Chief, TSS
 THROUGH : Chief, FI
 SUBJECT : SR BALLOON REQUIREMENTS

*note: Rec'd in TSS/ED
 on 23 Dec. Original and
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1. In the last few months the operational horizons of balloon use have been greatly expanded. We are now at a point where a new concept of operations can be considered. This has come about mainly as a result of the following developments:

a. Greater freedom of choice in launching. We have a new method of launching that allows us to launch personnel balloons in surface winds of higher velocity than before. The velocity at which we can launch has been increased from 10 to about 25 knots. This gives us greater freedom in choice of launching time and better trajectories. Thus our operational potential for both marine and land launchings is greatly increased.

**DACRON
SHROUD**

*Isn't this sort
of optimistic?
WE*

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c. Directional balloon. It is understood that a truly directional balloon can be developed in time to meet FY 1957 operational requirements. This should be a minimum-radar-detectable infiltration/exfiltration vehicle; and personnel and material requirements for transportation, launching and manning should approximate those of conventional balloons. It should also have the advantages of free balloon ^{flight} whenever desired.

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d. When

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d. When with the developments indicated above we combine the latest photographic and ~~ALINT~~ devices, remote control for unmanned balloons, and the ability to use higher altitudes, the prospects for successful intelligence collection in areas previously impossible to cover are considerably increased.

2. A consideration of the brief statements in the foregoing paragraph will bring out the great operational significance of balloon development. It is estimated that present balloon techniques allow us to penetrate the USSR for intelligence purposes over approximately 30% of the Soviet border. Satisfactory completion of development requested in the following paragraphs should allow us to penetrate the Soviet Union over approximately 60% of its border. Balloon penetration should be successful from a few miles to approximately 500 miles in depth.

3. SR Balloon Development Requirements outlined below are projected against future needs of the SR Division for the last quarter of fiscal year 1956, all of fiscal 1957, and the first half of fiscal 1958. While each of these requirements represents some part of the over-all program, in actual use it may turn out that a combination of these requirements will be the best answer to particular operational situations.

4. The development requirements in decreasing order of urgency are:

a. A medium altitude oxygen system for extended flights. At present we are limited to flight during periods of darkness in order to protect ourselves from daylight ground observation. This means we must now be satisfied with flights of short duration. In order to operate under a greater variety of conditions and in a greater number of places, we must develop a more efficient medium altitude oxygen system permitting the higher and longer flights required during daylight hours.

b. A medium altitude gondola. It may be that this gondola can be simply and easily pressurized in such a way that the gondola and the medium altitude oxygen system can be incorporated into one piece of equipment. The primary consideration is that the gondola must not be detectable by radar. Present metal gondolas are not suitable. There is some experience with fiberglass instrument gondolas. This may be the answer to the problem. This gondola must be capable of dual use for:

HAZEN suggests Air Mattress Construction

(1) Personnel

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[redacted]
 (2) Manned and unmanned ELINT and photo-graphic coverage of selected targets.

c. Empirical data concerning medium altitude flight characteristics of the Type 343 and 393 balloons. These should include flight at 30,000 feet for at least six hours.

d. A simple hot air generator sufficient to inflate and float a [redacted] balloon. The complete unit (balloon, generator, fuel and tools) should be small enough and light enough to be backpacked and cached by one person, thus permitting it to be carried in initially by balloon. Additional tools should be limited to one axe and one shovel. The fuel must be usable after burial for extended periods. Initial inflation should not take more than one hour, and the flame of the heater should be as little visible as possible. ED-136?

e. Empirical data showing flight characteristics of a hot air personnel balloon. These should cover flights of six hours duration and should relate to balloons capable of lifting a payload of 250 pounds to 9,000 feet.

f. A powered and aerodynamically shaped balloon of approximately the same capacity as the type 343 balloon, which will permit substantial, controlled deviations from the normal free flight trajectories. Power should be available for at least ten hours of flight. The power unit should possess radar reflectivity no greater than that of the radar reflecting metal photographic units which were used in the Phase One tests in the Minneapolis area in April 1955. [redacted]

Performance should be such that without power the unit can be flown as a free balloon. Inflation procedures should be so simple as to require no more than three men. Marine launching from limited deck space should be possible. The propeller design should be such that there will be no radar hazard either while motionless or while running.

g. A remote altitude control unit that will function reliably for at least 10 hours at ranges from 100 to 300 miles, and at altitudes up to 30,000 feet. This unit should be adaptable for use with present Type 33.8, the 37 ft or the Type 393 Balloons.

h. A silent

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h. A silent diffuser for inflation. A reduction in noise level should be obtained without significant reduction in the rate of flow of gas.

i. A small, fast, light weight hydrogen generator. Present hydrogen generators with sufficient reliability for field use have a volume comparable to that of a loaded 2½ ton truck. It is hoped that the final design may be reduced to a size that can be handled by two men, and that the rate of hydrogen production will be at least 2,000 cu. ft per hour.

5. It is requested that TSS promote the development of the above-mentioned items as rapidly as feasible. Should further information be required, the SE Division will be happy to furnish it. Please direct all questions to and coordinate development of these items with

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Approved

Chief, Foreign Intelligence

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